

## **AMENDMENTS TO THE SPECIFICATION**

Please replace the title with the following replacement title:

**“SECURE DATA ACCESS IN A MULTIDIMENSIONAL DATA ENVIRONMENT”**

Please replace the paragraph at page 3, lines 22-23 with the following replacement paragraph:

“FIGS. 10 through 28 <sup>[[29]]</sup> illustrate an example web-based user interface of the data access system by which the user can compose a report from a defined data cube.”

Please replace the paragraph at page 11, lines 8-18 with the following replacement paragraph:

“FIG. 6 illustrates in further detail a virtual table 34 for storing data received from data access system 12. As described below, data access system communicates the data in a stream of packets, which client-device 32 assembles to form virtual table 34. Based on input from the user, such as a request to scroll down, client-device 32 manipulates pointers into the virtual table 34 <sup>[[36]]</sup> to retrieve and display a viewable window 36 <sup>[[38]]</sup> of the data. Client-device 32 manipulates the document object model of web browser 33 based on input received from user 4 and data extracted from viewable window 36 <sup>[[38]]</sup>. When the document object model is adjusted, browser 22 refreshes the display of client-device 32, thereby allowing the user to scroll viewable window 36 <sup>[[38]]</sup> throughout virtual table 34 <sup>[[36]]</sup> and display a number of rows and columns. In one embodiment, virtual table 34 <sup>[[36]]</sup> is organized as a series of arrays.”

Please replace the paragraph at page 13, lines 12-25, with the following replacement paragraph:

“Based on the updated report object 15, page generation module 26 constructs queries to retrieve multi-dimensional data from data cubes 17 based on report object 15 for expanding virtual table 34 <sup>[[36]]</sup>. In one embodiment, an OLAP server storing data cube 17 executes the queries and communicate a result set to page generation module 26 in response. Page generation module 26 stores the result set as report data 28 (66). When constructing the query, cube interface object 24 accesses state data 29 to determine the current location of viewing window 36 <sup>[[38]]</sup> within virtual table 34 <sup>[[36]]</sup> in order to reduce the amount of data retrieved from data cube 17, i.e., the size of the result set. In this manner, page generation module 26 retrieves data from data cube 17 that is localized to the current viewable window 36 <sup>[[38]]</sup>. The typical overhead of an expand operation is thereby lessened. In one embodiment, page generation module 26 retrieves all rows starting at the current position of viewable window 36 <sup>[[38]]</sup> and below. In another embodiment, page generation module 26 retrieves only those rows proximate to window <sup>[[38]]</sup> within virtual table <sup>[[36]]</sup>.”

Please replace the paragraphs at page 14, lines 3-26 with the following replacement paragraphs:

“Next, as described above, packet engine 21 transmits an initial set of data packets to client-device 9 to populate an initial portion of virtual table 34 (68), which web browser 33 presents to the user 4 (70). Client device 32 then issues a request to application server 22 for the any additional data necessary to populate the expanded virtual table 34 [[36]] (72). In response, model converter 27 generates client-side script to update presentation model 35 to redimension virtual table 34 [[36]] to the appropriate number of rows to accommodate an expand or collapse request (74). In one embodiment, presentation model 35 is persistent between data loads. For example, presentation model 35 may be stored in a unique frame such that it remains in memory between page refreshes. Packet engine 21 transmits the script and any remaining data to client-device 32 (76). Client-device 32 executes the script to update presentation model 35 and stores the additional data in virtual table 34 [[36]] (78).

FIG. 9 is a flowchart of an example process for handling a user request to scroll viewing window 36 [[38]] through virtual table 34 [[32]]. Notably, the entire request is serviced by client-device 9 without requiring communication with data access system 12. Upon receiving a user request to scroll (82), client-device 32 manipulates the presentation model 35, which may be in the form of a document object model (84). For example, client-device 32 may move a top row of the presentation model 35 to the bottom row, thereby shifting all the rows of the presentation model up. Next, client-device 32 loads the bottom row of the presentation model with data from the next row of virtual table 34 [[36]], i.e., the row below the current position of window 36 [[38]] (86). When the presentation model is adjusted, browser 33 refreshes the display of client-device 32 (88). In this manner, the user can scroll viewable window 36 [[38]] throughout virtual table 34 [[36]] without requiring interaction with data access system 12.”

Please replace the paragraph at page 14, line 27 through page 15, line 8 with the following replacement paragraph:

“FIGS. 10 through 28 [[19]] illustrate an example web-based user interface of data access system 12 by which user 4 composes a report from data cube 17. FIG. 10 illustrates an example web page 90 presented by data access system 12 upon receiving a request to compose a new report. Web page 90 includes filter area 92 from which the user 4 selects one or more dimensions to include in the report. Filter area 92 lists all of the dimensions for the selected data cube 17 including, for example, Customers, Gender, Product, Promotions, Time, Educational Level, Marital Status, Promotion Media, Store Type and Yearly Income. Web page 90 also includes layout area 94 for defining the dimensions to be included in the composed report. For example, layout area 94 lists one active dimension, Store, and a number of a number of measures for the dimension: Profit, Profit per Units Sales, Store Cost, Store Sales and Unit Sales. In order to construct a report, a user 4 simply selects a dimension listed in filter area 92 and drags the dimension to layout area 92.”

Please replace the paragraph at page 15, lines 9-21 with the following replacement paragraph:

“FIG. 11, for example, illustrates a “drag and drop” feature of the user interface when constructing a report. Here, user 4 has selected the Promotions dimension and is adding it to layout area 94, thereby making it an active dimension for the report. Layout area 94 displays the active dimensions in a nested fashion indicating their respective places in the dimension hierarchy. As displayed in web page 90, the current layout for the report defines a dimension hierarchy of Promotions within Stores. The direction of arrow 96 [[95]] indicates where the dimension being added will be nested in relation to the currently active dimensions. As illustrated, arrow 96 [[95]] points to the left meaning that the new dimension will be added above the active dimension, creating, for example, a dimension hierarchy of Stores within Promotions. After the dimension is added, user 4 can manipulate the hierarchy by simply rearranging the dimensions within layout area 94. FIG. 12 illustrates web page 90 once the Stores dimension has been added to layout area 94.”

Please replace the paragraph at page 18, lines 18-26 with the following replacement paragraph:

“The user interface of data access system 12 has integrated graphing functionality that allows the user to easily generate graphs for the displayed data. FIG. 25 [[16]] illustrates the user preparing to create an embedded graph for the report. Specifically, the user has swapped the Store and Promotion dimensions within layout area 94 and changed set the filter for the Product dimension to All Products. The user has also selected a range of cells 114 for use with the graphing functionality. Web page 90 highlights and the range of cells 114 [[14]] and displays Select Function box 116, which offers several types of available charts or other functions. FIG. 26 illustrates a graph 118 generated by the user interface and displayed to the user for the selected range of cells 114.”

Please replace the paragraph at page 19, line 17-26 with the following replacement paragraph:

“FIGS. 29 through 33 [[34]] illustrate the user interacting with the user interface of data access system 12 to publish a report for access by other users 4. FIG. 29 illustrates a web page 132 after the user has transitioned from compose mode to publish mode by clicking publishing icon 130 (FIG. 19). Web page 132 includes a number of changes from web page 90 when the user was creating a report. Filter area 92 has been removed such that the user cannot add or remove dimensions. Furthermore, the active dimensions no longer have tabs for changing sub-filter selections. In addition, the user cannot rearrange the dimension hierarchy of the report by dragging and dropping the dimensions. Data area 96 displays the data in rows and columns, as displayed while the user was composing the report.”